**Introduction**: Impulse arc discharge in Line Lightning Protection Device (LLPD) triggered by lightning overvoltage is

**Results**: Preliminary simulation results allow to evaluate the influence of chamber geometry on arc decay rate.

**Computational Methods**: Set of magnetohydrodynamic (MHD) equations is applied to describe arc discharge behavior during lightning current pulse impact. Coupling of CFD and ACDC modules was implemented.

\[
\begin{align*}
\frac{\partial \rho}{\partial t} + \nabla \cdot (\rho u) &= 0 \\
\frac{\partial (\rho u)}{\partial t} + \nabla \cdot (\rho u \otimes u) &= -\nabla p + \nabla \cdot \mathbf{\hat{r}} [j \times \mathbf{B}] \\
\frac{\partial (\rho h)}{\partial t} + \nabla \cdot (\rho h u) &= \frac{\partial p}{\partial t} + \nabla \cdot (\mathbf{\hat{r}} u) + j \cdot E + \nabla \cdot (q_{\text{cond}} + q_{\text{rad}})
\end{align*}
\]

Terminal and Ground conditions are applied to corresponding electrodes. The boundary of air domain is set as Outlet.

**Conclusions**: Current state of simulations gives qualitative agreement with experimental data.

**References**: